Studies on Fishscale of Porcelain Enamel

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Chromium in sea-water is cocentrated in $Al(OH)_3$, precipitated as carrier. Aluminium hydroxide was dried and fused with a small amount of fusing mixture in Pt-crucible. The fused mass is then extracted with water, where the solution contains chromate, permanganate and vanadate. A few drops of C_2H_5OH is added to the solution in order to reduce permanganate, and then neutralized with H_2SO_4.

If V presents, it interferes the colorimetry of Cr in presence of diphenylcarbazied. In this case, V should de extracted beforehand with $CHCl_3$ in the form of Cr oxinate. Then Cr is quantitatively determined by colorimetry, with diphenylcarbazide. The results are as follows:-

Sample	Chromium content γ/L
I (Aug. 12, '49 at Shirahama, Wakayama Pref.)	Cl=19.16‰ 0.07
II (Dec. 25, '49 at 〃)	Cl=18.97‰ 0.05
III (Feb. 21, '50 at 〃)	Cl=19 25‰ 0.04

53. Studies on Fishscale of Porcelain Enamel.

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In order to produce fishscales artificially, the authors have treated steel plates, one side of which was coated by different kinds of enamels respectively by sulphuric acid. The volume of hydrogen which liberates at the enameled side by fishscaling was measured by the replacement of mercury. Tests were made on ground coat, antimony cover coat applied over ground coat and titanium cover coat applied over ground coat respectively. The applied quantity of the enamel was different for each case.

The results obtained are as follows; (1) For all types of enamel, the volume of hydrogen evolved at the fishscaling increases with the increase of the applied whight in the following manner: 0—1 mm^3 at 4 gr./dm^2., 1—2 mm^3 at 6 gr./dm^2 and 2—4 mm^3 at 8 gr./dm^2. No effects of types of enamel on the volum of hydrogen were found. (2) The fishscale produced has a shape of inverted frustum of a cone, the small base of which attached directly to the iroh base. The ratio between its height, radii of large and small bases was 1 : 5. 7 : 2. 3 and was independent of the size of the fishscale and the kind and weight of applied enamel. (3) The pressure of hydrogen necessary for producing a fishscale is calculated to be always about 110×10^6 dyne/cm^2, irrespective of the kind and applied weight of enamel. (4) Overfire decreases resistance to fishscale. (5) The mill addition of quartz power has a sure effect in preventing fishscale.